



U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

FEB 21 2003


Mr. Royce Ramsay
Vice President - Operations
Northern Natural Gas Company
1111 S. 103rd Street
Omaha, NE 68124-1091

Re: CPF No. 3-2003-1003-H

Dear Mr. Ramsay:

Enclosed is a Corrective Action Order issued by the Associate Administrator for Pipeline Safety in the above-referenced case. It requires you to take certain corrective actions, including a pressure reduction, with respect to your Reserve Mining pipeline in Minnesota. Service is being made by certified mail and facsimile. Your receipt of this Order constitutes service of that document under 49 C.F.R. § 190.5. The terms and conditions of this Corrective Action Order are effective upon receipt.

Sincerely,


for Gwendolyn M. Hill
Pipeline Compliance Registry
Office of Pipeline Safety

Enclosure

VIA CERTIFIED MAIL (RETURN RECEIPT REQUESTED) AND TELECOPY

**DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
WASHINGTON, DC 20590**

In the Matter of)
)
Northern Natural Gas Company,)
)
Respondent.)
)

CPF No. 3-2003-1003-H

CORRECTIVE ACTION ORDER

Purpose and Background

This Corrective Action Order is being issued, under authority of 49 U.S.C. § 60112, to require Northern Natural Gas Company (Respondent) to take the necessary corrective action to protect the public, property, and the environment from potential hazards associated with a failure on Respondent's Reserve Mining pipeline extending from southern St. Louis County, west of Duluth, Minnesota, to the Northshore Mining Town Border Station (TBS) in Lake County, Minnesota.

On February 11, 2003, Respondent reported a rupture approximately 0.7 miles upstream of the Northshore Mining TBS on its 16-inch Reserve Mining pipeline. The cause of the failure has not yet been determined. Pursuant to 49 U.S.C. § 60117, the Central Region, Office of Pipeline Safety (OPS) initiated an investigation of the incident.

Preliminary Findings

1. On February 11, 2003, at approximately 12:17 A.M. CST, Respondent's 16-inch diameter Reserve Mining pipeline ruptured in Lake County, Minnesota resulting in the release of natural gas which subsequently ignited.
2. The incident occurred in a wooded area about one mile east of the town of Silver Bay, Minnesota at Mile Post (MP) 62.7. Portions of the subject pipeline are routed near populated areas and state and local highways.
3. The subsequent fire resulted in the temporary closure of State Highway 61. No injuries, fatalities, or evacuations were reported.

4. Respondent's Reserve Mining pipeline originates in southern St. Louis County near Duluth, Minnesota and extends approximately 63.4 miles to the northeast along the north shore of Lake Superior and terminates at the Northshore Mining TBS in Lake County.
5. The failure occurred at MP 62.7, approximately 1 ½ miles north of the take-off point at MP 61.2 for the 4-inch branch line which runs to the Silver Bay TBS.
6. Following the incident, Respondent's personnel responded by controlling the pressure to the rupture site and Silver Bay while an alternate natural gas supply was arranged to maintain service to Silver Bay. The affected line segment was then isolated at the mainline valve near MP 47, permitting the segment running north to Northshore Mining to be capped so that service could be restored to Silver Bay. Repairs to restore service to Northshore Mining were then undertaken.
7. The cause of the failure has not yet been determined. The preliminary investigation indicates that the rupture may have originated in the longitudinal weld seam. The length of the rupture is approximately 677 feet. Respondent plans to transport the section of pipe containing the fracture origin to a metallurgist in Houston, Texas for detailed analysis.
8. The Reserve Mining pipeline was installed in 1961 and is constructed of 16-inch nominal diameter, 0.219-inch wall thickness, API 5LX, electric resistance welded (ERW) pipe manufactured by Republic Steel with a specified minimum yield strength of 52,000 psig.
9. The Reserve Mining pipeline is cathodically protected by impressed current. The protective coating is composed of coal tar enamel.
10. The maximum allowable operating pressure of the subject pipeline is 832 psig. The operating pressure at the failure site at the time of the incident was approximately 814 psig.
11. The Reserve Mining pipeline was hydrostatically tested at a pressure of 1250 psig in 1961.
12. The last reported failure on the subject pipeline occurred on August 27, 1994 at MP 29.5. The Respondent determined from its metallurgical analysis that the failure was caused by stress corrosion cracking in the ERW longitudinal weld seam. As a result of this failure, OPS issued a Hazardous Facility Order (HFO) that was later amended to require that Respondent develop a written plan to remediate any factors contributing to stress corrosion cracking. Pursuant to the HFO, Respondent conducted close-interval surveys and excavated and examined eleven locations on the pipeline that were deemed potentially susceptible to stress corrosion cracking. Respondent subsequently reported that no evidence of stress corrosion cracking was found during these examinations.

13. The subject pipeline was internally inspected in 1995, under the above referenced HFO, with a magnetic flux leakage in-line inspection tool. As a result of this inspection, nine areas of the pipeline were excavated and examined. Respondent reported that no evidence of stress corrosion cracking was found during these examinations.
14. The pipeline's operating history also includes a reported leak incident on June 10, 1982 at MP 14.75, the probable cause of which was determined to have been a longitudinal weld seam failure.
15. Respondent is headquartered in Omaha, Nebraska and operates approximately 17,000 miles of pipelines that supply natural gas to the midwestern region of the country. Respondent is a subsidiary of the MidAmerican Energy Holdings Company.
16. OPS issued Alert Notices on January 28, 1988 and March 8, 1989 informing pipeline operators that low-frequency ERW pipe, such as the pipe used to construct the Reserve mining pipeline, was subject to longitudinal weld seam failures caused by the presence of manufacturing defects in the ERW seams that can grow over time. Seam corrosion and cyclic fatigue have been found to have contributed to the growth of these defects and in some cases, operational failures have occurred many months or years after successful hydrostatic testing was conducted.

Determination of Necessity for Corrective Action Order and Right to Hearing

Section 60112 of Title 49, United States Code, provides for the issuance of a Corrective Action Order, after reasonable notice and the opportunity for a hearing, requiring corrective action, which may include the suspended or restricted use of a pipeline facility, physical inspection, testing, repair, replacement, or other action as appropriate. The basis for making the determination that a pipeline facility is hazardous, requiring corrective action, is set forth both in the above referenced statute and 49 C.F.R. §190.233, a copy of which is enclosed.

Section 60112, and the regulations promulgated thereunder, provides for the issuance of a Corrective Action Order without prior opportunity for notice and hearing upon a finding that failure to issue the Order expeditiously will result in likely serious harm to life, property or the environment. In such cases, an opportunity for a hearing will be provided as soon as practicable after the issuance of the Order.

After evaluating the foregoing preliminary findings of fact, I find that the continued operation of the Reserve Mining pipeline without corrective measures would be hazardous to life, property and the environment. Additionally, after considering the pipeline's prior operating history, age of the pipe and method of manufacturing, the proximity of the pipeline to populated areas, the line's proximity to public highways, the highly combustible nature of the product the pipeline transports, the pressure required for transporting the material, and the lack of a determination as to the cause of the failure, I find that a failure to expeditiously issue this Order, requiring immediate corrective action, would likely result in serious harm to life, property, and the environment.

Accordingly, this Corrective Action Order mandating needed immediate corrective action is issued without prior notice and opportunity for a hearing. The terms and conditions of this Order are effective upon receipt.

Within 10 days of receipt of this Order, Respondent may request a hearing, to be held as soon as practicable, by notifying the Associate Administrator for Pipeline Safety in writing, delivered personally, by mail or by telecopy at (202) 366-4566. The hearing will be held in Kansas City, Missouri or Washington, D.C. on a date that is mutually convenient to OPS and Respondent.

After receiving and analyzing additional data in the course of this investigation, OPS may identify other corrective measures that need to be taken. In that event, Respondent will be notified of any additional measures required and amendment of this Order will be considered. To the extent consistent with safety, Respondent will be afforded notice and an opportunity for a hearing prior to the imposition of any additional corrective measures.

Required Corrective Action

Pursuant to 49 U.S.C. § 60112, I hereby order Northern Natural Gas Company to immediately take the following corrective actions with respect to its entire Reserve Mining pipeline extending from southern St. Louis County, west of Duluth, Minnesota, to the Northshore Mining Town Border Station in Lake County, Minnesota.:

- 1) Maintain a minimum 20 percent (20%) reduction in the in-service operating pressure on the entire Reserve Mining pipeline, the operating pressure of which is not to exceed 80 percent of the operating pressure in effect just prior to the failure. Specifically, the operating pressure is not to exceed 651 psig. This pressure restriction shall remain in effect until written approval to return the pipeline to normal service is obtained from the Director, Central Region, OPS.
- 2) Determine the cause of the failure and identify any contributing factors by conducting detailed metallurgical testing and failure analysis of the ruptured section of pipe. In addition to failure analysis, the metallurgical testing must include an evaluation of the failed pipe section for the presence of stress corrosion cracking or any other condition that could affect the long-term integrity of the pipeline. Provide the Director, Central Region, OPS with at least 7 days advance notice of the date scheduled for this testing, which OPS may elect to witness, and submit the testing protocol to the Regional Director for approval as soon as it is developed. Submit all metallurgical analysis reports to the Regional Director within 7 days of your receiving them.
- 3) Re-evaluate and analyze the data from the 1994 close-interval surveys and the 1995 in-line inspection tool survey for the purpose of determining: (1) whether this failure occurred at one of the 20 sites excavated and examined in connection with those surveys; (2) whether any anomalies existed that may have contributed to this failure; and (3) whether any conditions or

factors that contributed to this failure exist in other segments of the Reserve Mining pipeline. Submit a report on this item to the Regional Director within 30 days following receipt of this Order.

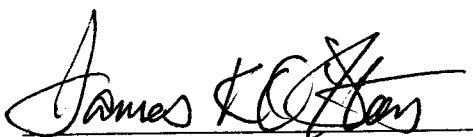
- 4) Submit a written return-to-service plan, with a proposed schedule for testing and repairs, for prior approval by the Regional Director within 20 days of your receipt of this Order. The plan must provide for the evaluation and remediation of all known or suspected factors in the February 11, 2003 failure and must describe the inspection and repair criteria that will be used in the process. Update the plan as necessary to incorporate the results of the testing and analysis required in Items 2 and 3 above as they become available.
- 5) The return-to-service plan must include hydrostatic testing, or other appropriate test method if such method is first approved by the Regional Director, of the subject pipeline for the purpose of evaluating the overall integrity of the pipeline. Submit summary reports on the results of this testing for each segment as it is completed that include information on the nature of any failures encountered, failure location, failure pressure, and method of repair.
- 6) Each element of the plan and its scheduling must be approved in advance by the Regional Director, who may provide the approvals incrementally. The plan may be revised, as necessary, to incorporate new information obtained during the investigation and determinations concerning the cause of the failure. The plan must be fully implemented, as each element is approved, according to the plan schedule.
- 7) Respondent must obtain approval from the Director, Central Region, OPS to remove the pressure restriction set forth in this Corrective Action Order. Respondent must submit information that demonstrates the hazard has been abated and that restoring the segment to its pre-failure operating pressure is justified based on an analysis showing that the pressure increase is safe considering all known defects, anomalies and operating parameters of the pipeline. After written approval from Regional Director, Respondent may resume operation at the pre-failure operating pressure.

The Director, Central Region, may grant an extension of time for compliance with any of the terms of this Order for good cause. A request for an extension must be in writing.

Respondent may appeal any decision of the Director, Central Region, OPS to the Associate Administrator for Pipeline Safety. Decisions of the Associate Administrator shall be final.

The procedures for the issuance of this Order are described in Part 190, Title 49, Code of Federal Regulations, § 190.233, a copy of which is enclosed, is made part of this Order and describes the Respondent's procedural rights relative to this Order.

Failure to comply with this Order may result in the assessment of civil penalties of not more than \$100,000 per day and in referral to the Attorney General for appropriate relief in United States District Court.

A handwritten signature in black ink, appearing to read "James Gerard", is written over a horizontal line.

Stacey Gerard

Associate Administrator for Pipeline Safety

FEB 21 2003

Date Issued